

11-02-00

A



23932

PATENT TRADEMARK OFFICE

Patent Application
Docket No. 34650-604PT

JC914 U.S. PTO
09/703351



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of: Anders Borgström, Magnus Hollström, and Torbjörn Gärdenfors

For: METHOD AND SYSTEM FOR CONFIGURING AND UNLOCKING AN
ELECTRONIC READING DEVICE

BOX PATENT APPLICATION
Assistant Commissioner
for Patents
Washington, D.C. 20231

CERTIFICATE OF MAILING BY EXPRESS MAIL

"EXPRESS MAIL" Mailing Label No. EL 524 961 647 US

Date of Deposit: October 31, 2000

I hereby certify that this paper or fee is being deposited with the U.S.
Postal Service "Express Mail Post Office to Addressee" service under
37 CFR 1.10 on the date indicated above and is addressed to the Assistant
Commissioner for Patents, Washington, D.C. 20231

Type or Print Name: Carolyn Bova

Signature

Sir:

PATENT APPLICATION TRANSMITTAL LETTER

Transmitted herewith for filing, please find the following:

- ☒ Specification, claims and abstract of the above-referenced patent application (total of 61 pages)
- ☒ 9 sheet(s) of drawing(s) (___ formal/ ☒ informal).
- ☒ Combined Declaration and Power of Attorney (unexecuted).
- ___ An Assignment of the invention to: Telefonaktiebolaget LM Ericsson (publ)
- ___ A verified statement claiming small entity status under 37 CFR 1.9 and 1.27.
- ☒ Other (specify): Acknowledgment postcard.
- ___ This application is a:

- ___ Continuation
- ___ Divisional
- ___ Continuation-In-Part

of prior copending parent application Serial No. _____ filed on _____
now pending.

Please amend the application to insert the following line in the beginning of the specification:

--This application is a Continuation of prior application Serial No. _____ filed on _____, now pending.--

In the event that a petition to extend time under 37 CFR 1.136 is necessary in the parent application to maintain copendency for this application, a petition for an extension of the necessary time to maintain copendency is hereby requested for the parent application and the Commissioner is hereby authorized to debit our Account Number 10-0447 for the necessary fees.

The filing fee has been calculated as shown below:

	NO. FILED	NO. EXTRA	RATE	FEE
BASIC FEE				\$710
TOTAL CLAIMS	32-20	12	\$18	216
INDEPENDENT CLAIMS	5-3	2	\$80	160
MULTIPLE DEPENDENT CLAIM(S) PRESENTED			\$260	
TOTAL FEES:				\$1,086
Deduct one-half of fee for Small Entity				-
ASSIGNMENT RECORDAL FEE			\$40	
TOTAL AMOUNT DUE:				\$1,086

___ Please charge my Deposit Account No. 10-0447 in the amount of \$ _____

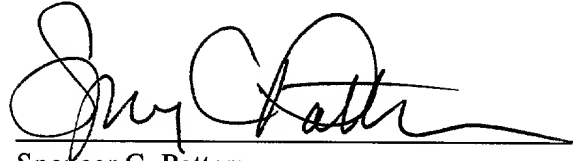
___ Check(s) in the amount of \$ _____ is/are attached. Please charge any deficiency or credit any overpayment to Deposit Account No. 10-0447.

___ The Commissioner is hereby authorized to charge payment of the following fees during the pendency of this application or credit any overpayment to Deposit Account No. 10-0447.

___ Any patent application processing fees under 37 CFR 1.17 and under 37 CFR 1.20(d).

___ The issue fee set in 37 CFR 1.18 at or before mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(b).

___ Any filing fees under 37 CFR 1.16 including fees for presentation of extra claims.

A handwritten signature in black ink, appearing to read "Spencer C. Patterson", written over a horizontal line.

Spencer C. Patterson

Registration No. 43,849

JENKENS & GILCHRIST,
a Professional Corporation
3200 Fountain Place
1445 Ross Avenue
Dallas, Texas 75202-2799
214/855-4177 (Direct)
214/855-4300 (Fax)

2025 SEP 11 10 10 AM '25

CERTIFICATE OF MAILING BY EXPRESS MAIL	
"EXPRESS MAIL" Mailing Label No.	
EL 524 961 647 US	31
Date of Deposit October	2000
I hereby certify that this paper or fee is being deposited with the U.S. Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Box Patent Application, Washington, D.C. 20231	
Type or Print Name	Carolyn Bova
Signature	<i>Carolyn Bova</i>

METHOD AND SYSTEM FOR CONFIGURING AND
UNLOCKING AN ELECTRONIC READING DEVICE

REFERENCE TO EARLIER FILED PROVISIONAL APPLICATIONS

This patent application claims the benefit of
priority from, and incorporates by reference the entire
5 disclosure of, co-pending U.S. Provisional Patent
Application Serial Nos. 60/182,742, filed on February 16,
2000, 60/190,343, filed on March 16, 2000, and 60/192,662,
filed on March 28, 2000.

CROSS REFERENCE TO RELATED APPLICATION

10 The present application for patent is related to and
hereby incorporates by reference the subject matter
disclosed in U.S. Patent Application Serial Nos.

_____ (Attorney Docket No.34650-566PT),
entitled "Specially Formatted Paper Based Applications of
a Mobile Phone"; _____ (Attorney Docket
No.34650-569PT), entitled "Method and System for Using an
5 Electronic Reading Device as a General Application Input
and Navigation Interface"; _____ (Attorney
Docket No.34650-578PT), entitled "Predefined Electronic
Pen Applications in Specially Formatted Paper";

_____ (Attorney Docket No. 34650-579PT),
10 entitled "A System and Method for Operating an Electronic
Reading Device User Interface"; _____
(Attorney Docket No. 34650-601PT), entitled "Method and
System for Using an Electronic Reading Device on Non-paper
Devices"; _____ (Attorney Docket No. 34650-
15 602PT), entitled "Multi-layer Reading Device";

_____ (Attorney Docket No. 34650-606PT),
entitled "Printer Pen"; _____ (Attorney Docket
No. 34650-607PT), entitled "Method and System for
Electronically Recording Transactions and Performing
20 Security Function"; _____ (Attorney Docket No.
34650-608PT), entitled "Electronic Pen with Ink On/ink off
Function and Paper Touch Sensing"; _____
(Attorney Docket No. 34650-654PT), entitled "Method and

System for Handling FIFO and Position Data in Connection
with an Electronic Reading Device"; _____

(Attorney Docket No. 34650-655PT), entitled "Hyperlink
Applications for an Electronic Reading Device";

5 _____ (Attorney Docket No. 34650-656PT),
entitled "Measuring Applications for an Electronic Reading
Device"; _____ (Attorney Docket No. 34650-

657PT), entitled "Method and System for Controlling an
Electronic Utility Device Using an Electronic Reading
10 Device"; and _____ (Attorney Docket No. 34650-
658PT), entitled "Positioning Applications for an
Electronic Reading Device"; and _____

(Attorney Docket No. 34650-673PT), entitled "Method for
Sharing Information Between Electronic Reading Devices";
15 and in U.S. Provisional Patent Application Serial Nos.

_____ (Attorney Docket No. 34650-671PL),
entitled "Electronic Pen for E-Commerce Implementations";
and _____ (Attorney Docket No. 34650-672PL),
entitled "Electronic Pen Help Feedback and Information
20 Retrieval"; all filed concurrently herewith.

BACKGROUND OF THE INVENTION

Technical Field of the Invention

The present invention relates in general to the communications field, and in particular to an interaction
5 of an electronic reading device with an address pattern.

Description of Related Art

Numerous devices exist for accepting user input and controlling user interaction with desktop and portable computers, personal digital assistance (PDAs), mobile
10 phones, and other types of electronic devices. For example, a keyboard can be used to accept typed input and other types of commands, a mouse or a track-ball can be used to provide relative motion input as well as various types of point-and-click selections, a keypad can be used
15 to provide input of numerical data and functional commands, navigational keys can be used for scrolling lists or otherwise repositioning a cursor, and various types of touchpads or touchscreens can be used to provide absolute positional coordinate inputs. Each type of
20 mechanism for accepting input and for supporting user interaction has benefits and disadvantages in terms of size, convenience, flexibility, responsiveness, and easy

of use. Generally, the selection of a particular type of input mechanism is dependent upon the function of the application and the degree and type of interaction required.

5 With the ever expanding capabilities and availability of applications both on the Internet and the area of wireless technology, there continues to be a need to develop and provide new mechanisms for accepting input and interacting with users. In particular, some of the
10 existing technologies suffer from drawbacks or limitations, such as size and flexibility, that make them impractical and/or inconvenient to use in some situations. By expanding the range of mechanisms for supporting user interaction, application developers and end-users can have
15 greater flexibility in the selection of input devices. Preferably, any such new mechanisms will provide increased flexibility and will maximize user convenience. In addition, the development of new mechanisms for interacting with users can expand the realm of potential
20 applications.

For example, while a keyboard typically provides a great deal of flexibility, particularly when it is used in connection with a mouse, a touchscreen, or other

navigational device, its size makes it inconvenient in many cases, especially in the wireless context.

SUMMARY OF THE INVENTION

The present invention comprises a method and system
5 for configuring and unlocking an electronic reading
device. In particular, the electronic reading device can
be configured by entering information on an address
pattern of a specially formatted surface by writing on, or
touching selected positions on the address pattern. The
10 written information, or the information that corresponds
to the selected positions, is detected by the electronic
reading device using a reading sensor that detects one or
more portions of the electronic reading device relative to
the address pattern. The detected position or positions
15 are converted into configuration data by a processor
within the electronic reading device or in a server
associated therewith. For example, handwritten
information or a selection of particular alphanumeric
fields can be converted into alphanumeric characters. The
20 configuration is then stored in the electronic reading
device or in the server. As a result, the configuration

data is associated with the electronic reading device for all subsequent use of the electronic reading device.

5 In one embodiment of the invention, the configuration data comprises a personal identification number (PIN) or handwritten signature. Each time the electronic reading device is subsequently powered up, the user of the device will be required to enter the PIN or signature to enable use of, or unlock, the electronic reading device. In particular, the entered information is compared with a
10 stored PIN or signature to determine whether there is a match. If so, the electronic reading device is enabled or unlocked. By using such an unlocking scheme, unauthorized use of the electronic reading device can be prevented.

BRIEF DESCRIPTION OF THE DRAWINGS

15 For a more complete understanding of the present invention, reference is made to the following detailed description taken in conjunction with the accompanying drawings wherein:

FIGURE 1 is a block diagram of a system in which an
20 electronic pen can be used as an input device;

FIGURE 2 is a schematic diagram of a system for supporting use of the electronic pen described in connection with FIGURE 1;

FIGURE 3 is an illustration of the protocol stacks that can be used in the case of local communications between an electronic pen and an electronic pen client;

FIGURE 4 is an illustration of protocol stacks that can be used when an electronic pen and an electronic pen client communicate with one another via an Internet connection;

FIGURE 5 is an illustration of a protocol stack for communications between an electronic pen client and each of the supporting entities when the electronic pen client is not located within a server on the Internet;

FIGURE 6 is an illustration of protocol stacks that are used for communications between an electronic pen client and each of the supporting entities when the electronic pen client is located on the Internet;

FIGURE 7 is a block diagram of the electronic pen logic that handles positions, strokes, actions, and grid descriptions;

FIGURE 8 is a block diagram of a state machine for the electronic pen control block shown in FIGURE 7;

FIGURE 9 is a block diagram of a state machine for an electronic pen client;

FIGURES 10A-10C are a message flow and signaling diagram illustrating the operation of the electronic pen system shown and discussed in connection with FIGURE 2;

FIGURE 11 is a block diagram of the electronic pen for use in configuring the electronic pen in accordance with one possible embodiment of the present invention; and

FIGURE 12 illustrates an example of an electronic pen setting form that can be included as a page in the electronic pen user manual and that can be used for configuring the electronic pen; and

FIGURE 13 is a schematic diagram of a system for use in establishing a connection after selection of the established connection box shown in FIGURE 12.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to a system in which an electronic reading device, such as an electronic pen, an electronic mouse, or a hand scanner, works in cooperation with an address pattern (e.g., a specially formatted paper) to provide for a detection of a location of the electronic reading device over the address pattern. For

instance, a pattern of dots can be defined such that, by examining a very small portion of the pattern, a precise location in the overall pattern can be determined. In fact, it is possible to define a pattern that has the size
5 of 73,000,000,000,000 A4 pages, which is equivalent to half the size of the entire United States. Portions of the pattern can be placed on sheets of paper or other objects.

Then, using an electronic scanner pen that can detect the dots in the pattern, it is possible to detect the
10 location of the pen with respect to the unique pattern. For example, when such a pen is used in connection with a specially formatted paper, the pen can detect its position (e.g., using a built in camera) by detecting a 3 mm by 3 mm portion of the pattern. By taking approximately 100
15 pictures per second, the pen is capable of determining its exact position to within 0.1 mm or less. This system can be used to provide user input, to facilitate user interaction, or to store handwritten notes or drawings. Moreover, by associating portions of the overall pattern
20 with certain applications, such a system can be used to interact with wide variety of applications.

Referring now to FIGURE 1, there is illustrated an example of a system 2 in which an electronic pen 10 can be

used as an input device. The electronic pen 10 includes an ink cartridge and is capable of writing in a typical fashion. The electronic pen 10, however, includes some type of sensor (e.g., a built-in camera) that is used for
5 detecting an address pattern on a specially formatted piece of paper 12. In particular, the paper 12 is formatted with a small portion of a large address pattern such that when the electronic pen 10 is used to write on or otherwise make marks on the paper 12, the writings or
10 markings can be electronically detected and stored.

As an example, the paper 12 might constitute a form that can be used for sending an email. Thus, the paper 12 might include a space for writing in the email address of an intended recipient, a space for writing a subject of
15 the email, and a space for writing the body of the email. As the electronic pen 10 is used to fill in each of the spaces, the position and movement of the electronic pen 10 on the paper 12 can be determined by repeatedly detecting the current x, y coordinates of the pen 10 (e.g., at rate
20 of 100 frames per second). The markings can then be converted into ASCII text using an appropriate handwriting recognition program. Once the user completes the form,

the email can be sent, for example, by checking a send box at a predetermined location on the paper 12.

5 Preferably, the coordinate information collected by the pen 10 is sent by a short range radio transmitter in the electronic pen 10 to a nearby mobile station 14 using a short range radio interface 16 such as a local wireless radio link (e.g., a local wireless radio link supported by Ericsson's Bluetooth™ wireless communications technology). Alternatively, instead of using a mobile station 14, the coordinate information could also be sent to, for instance, a desktop or portable computer, a personal digital assistant (PDA), a television, or a Bluetooth terminal. Moreover, instead of using a local wireless radio link, other types of local wireless links, such as inductive coupling and infrared light; other types of radio links, such as Global System for Mobile Communication (GSM); or wired transmission media, such as a cable can also be used. The information can then be forwarded via an appropriate link, such as a cellular air interface 18, to a base station 20 or other network node.

Referring now to FIGURE 2, there is illustrated a schematic diagram of a system 2 for supporting use of the electronic pen 10 described in connection with FIGURE 1.

Throughout the subsequent discussion, the system 2 is described primarily in connection with an electronic pen 10. It will be understood, however, that the invention and the underlying system 2 can instead use any type of electronic reading device, such as an electronic pen, an electronic mouse, or a hand scanner. As shown in FIGURE 2, the system 2 includes six different entities, including the electronic pen 10, electronic pen client 22, a control node 24, a name server 26, a base translator 28, and an application server 30. Although these various devices are described and depicted separately, it is also possible to combine two or more of the entities into the same device (e.g., the electronic pen 10 and electronic pen client 22 can be contained in the same device).

The electronic pen 10 is responsible for detecting positions on the address pattern, producing actions, and sending information to the electronic pen client 22. In addition to being able to leave pen markings, some electronic pens can also have the ability to produce other types of output, such as sound, vibration, or flashing lights. The electronic pen 10 includes a memory for storing a current grid, which comprises information relating to an area of the address pattern that is near

the most recently detected position of the electronic pen 10. When the electronic pen 10 is loaded with the current grid, it knows what actions to take based on the positions that are read from the address pattern. When the

5 electronic pen 10 is first turned on or when it moves to an area outside of the current grid, the electronic pen 10 must first request a new grid description before it can continue processing information. In such a situation, the electronic pen 10 requests a new grid description from the

10 electronic pen client 22.

The electronic pen client 22 can be located in a mobile station 14, in a PDA, in a desktop or portable computer, in the electronic pen 10 itself, in a server somewhere on the Internet, or in another device. The

15 electronic pen client 22 serves as the center of communications in the overall system 2. In particular, the electronic pen client 22 receives new grid requests and action requests from the electronic pen 10 and responds to these requests by contacting an appropriate

20 entity within the overall system 2 to properly respond to the request from the electronic pen 10. Furthermore, when the electronic pen 10 is being used in connection with a particular application, the electronic pen client 22 can

store the application and/or any corresponding data received from the electronic pen 10 to facilitate processing and use of the application.

5 The name server 26 is used for translating a detected position on the address pattern into a Uniform Resource Location (URL) associated with that position. Different portions of the address pattern are assigned to different applications. Neither the electronic pen 10 nor the electronic pen client 22, however, is aware of all of the
10 different applications and the particular areas assigned to each application. Thus, when the electronic pen 10 detects a new or unknown position, it forwards the position information to the electronic pen client 22, which in turn sends the information to the name server 26.
15 The name server 26 then identifies an application associated with the received position and retrieves a URL where a description of the particular application can be found. The retrieved URL can then be used by the electronic pen client 22 to retrieve the application
20 description.

As an alternative, the name server 26 can comprise a global name server that keeps track of a location, in the form of URLs to local name servers, where more information

can be found about different addresses in the pattern.
Similarly, each local name server can use other local name
servers to obtain the necessary information, i.e., to
convert a position into a URL where an application
5 description can be found. At the lowest level, the local
electronic pen client should know all the paper addresses
that are within a specific application or applications.

There are some services that should be available in
the overall system 2 for which it is inconvenient or not
10 feasible to support such services in the electronic pen 10
or the electronic pen client 22. In such a case, the base
translator 28 can be used to support the services. For
example, the base translator 28 might contain handwriting
recognition software for converting pen actions into text
15 or for converting pen actions into a predefined set of
symbols. When such services are needed, the electronic
pen client 22 can send a request to the base translator 28
along with the necessary data, and the base translator 28
can perform the requested service.

20 Another entity in the system 2 is a control node 24.
The control node 24 is used for responding to actions in a
standardized way. For example, the control node 24 can be
used to respond to certain generic functions, such as

"cancel" or "submit" functions, in a consistent manner without regard to the particular application that is currently active.

5 In addition, the control node 24 is used for creating streaming-like applications. For instance, some applications might require that the positions on the address pattern that are detected by the electronic pen 10 be immediately sent, upon detection, to the electronic pen client 22 for use by the application (i.e., the electronic pen 10 does not wait to transmit the position data until a complete stroke is detected or until a "send" field is touched). One example is an application that is used to control an industrial robot in a warehouse. In such a case, the application description that is loaded onto the electronic pen server 22 can include instructions that all 15 positions be streamed to a control node 24. As a result, the control node 24 can receive the positions in real time and can control the robot without waiting for the form (i.e., the current grid) to be completed. Thus, the control node 24 can perform a real-time translation from 20 detected positions to a responsive action, such as moving an object (e.g., a robot, a valve, etc.) or controlling a process.

5 The application server 30 is a regular web or
wireless application protocol (WAP) server that supports
an application associated with a particular area of the
address pattern. The application server 30 stores an
application description and provides the application
description to the electronic pen client 22 upon request.
In addition, the application server 30 receives input data
from the electronic pen 10 via the electronic pen client
22. For example, the application description might define
10 a number of data entry areas on a form. Thus when data is
entered on the form by the electronic pen 10, the data is
received by the electronic pen client 22, converted into
text using handwriting recognition software, and forwarded
to the application server 30, which stores the data or
15 otherwise processes the data in accordance with the
function of the application.

Referring now to FIGURES 3 through 6 there are
illustrated various examples of protocol stacks that can
be used for communicating between the entities shown in
20 FIGURE 2. Generally, however, such protocols apply
however, only if the two communicating entities are
implemented in different devices. If two or more entities
are combined into one device, a proprietary protocol can

be used to communicate between the entities. FIGURE 3 illustrates the protocol stacks that can be used in the case of local communications (e.g., using Bluetooth) between the electronic pen 10 and the electronic pen client 22. If, on the other hand, the electronic pen 10 and the electronic pen client 22 communicate with one another via an Internet connection, the protocol stacks depicted in FIGURE 4 will be used. FIGURE 5 illustrates a protocol stack for communicating between the electronic pen client and each of the supporting entities, such as the name server 26, the control node 24, the base translator 28, and the application server 30, when the electronic pen client 22 is not contained within a server on the Internet (e.g., such as when the electronic pen client 22 is located in a mobile phone 14). Finally, FIGURE 6 depicts the protocol stacks that are used when the electronic pen client 22 is located on the Internet.

There are a number of procedures that can be used by the various entities in the system 2 to allow the system to operate properly. When the electronic pen 10 detects a position on the address pattern that is not within its currently loaded grid or when the electronic pen 10 has no currently loaded grid, the electronic pen 10 initiates a

new grid procedure. The new grid procedure involves sending a new grid request object to the electronic pen client 22. The new grid request object contains the newly detected position, a description of the actions that the electronic pen 10 can natively support, and a description of the output signals that the electronic pen 10 supports. The reply to a new grid request object is a grid description, which can be provided by the electronic pen client 22 from its own internal memory or from the information provided by an application server 30. Generally, the electronic pen client 22 extracts the grid description from an application description received from the application server 30. The grid description should only contain action-field-types that the electronic pen 10 has indicated that it natively supports, which means that the electronic pen client 22 in some cases should convert the extracted grid description into a format that the electronic pen 10 can understand.

In some situations, it may be necessary for the electronic pen 10 to unload its current grid at the request of the electronic pen client 22. In such a case, the electronic pen client 22 sends an empty grid description to the electronic pen 10, thereby causing the

electronic pen 10 to unload its current grid. This can occur, for example, when a particular application is complete or when a new grid description request received from the electronic pen 10 cannot be fulfilled, such as
5 when the position received from the electronic pen 10 is not registered in the name server 26.

Another similar message is the empty grid description with a grid exception. When the electronic pen 10 requests a new grid description from the electronic pen
10 client 22, the electronic pen client 22 uses the detected position specified in the request to ask the name server 26 for a URL where the application description can be found. If no URL is returned, the electronic pen client 22 can send an empty grid description with a grid
15 exception to the electronic pen 10. The grid exception comprises a rectangle or other shape indicating the area around the detected position where no registered applications can be found. Preferably, the indicated area is as large as possible so that the electronic pen 10
20 and/or electronic pen client 22 know the extent of the surrounding area that is unassigned and do not have to repeatedly send requests to the name server 26. Thus, the empty grid description with a grid exception causes the

electronic pen 10 to unload its current grid and also informs the electronic pen 10 of an area surrounding the detected position that can essentially be ignored because its is not associated with any application.

5 The procedure that is used when the electronic pen 10 detects a new position is a find application description location procedure. This procedure is used by the electronic pen client 22 to translate a detected position received from the electronic pen 10 into a URL where a
10 description of an application corresponding to that position can be found. The procedure involves sending a request from the electronic pen client 22 to the name server 26 containing identification of the detected position. The name server 26 responds by sending a reply
15 to the electronic pen client 22 containing a URL where an application description can be found or, if the detected position is not registered in the name server 26, containing an indication that no associated application is known to exist.

20 Once the electronic pen client 22 knows the URL where an application description can be found, the electronic pen client 22 can initiate a get application description procedure, which allows the electronic pen client 22 to

retrieve the application description from the application
server 30. In particular, the electronic pen client 22
sends an application description request containing a
unique ID for the requesting electronic pen 10 and/or
5 electronic pen client 22 to the application server 30
located at the URL address provided by the name server 26.
In response, the application server 30 provides an
application description object to the electronic pen
client 22, which loads the application onto the electronic
10 pen client 22. The application description object is
similar to an HTML form with some additions and
modifications.

Furthermore, the application description object can
be sent from the application server 30 to the electronic
15 pen client 22 in response to a submitted form (i.e., a
submission of one completed form might automatically
result in a new form being loaded onto the electronic pen
client 22). A related procedure is the application submit
procedure, which is used by the electronic pen client 22
20 when the user of the electronic pen 10 selects a "submit"
field in a form. In response to the selection of the
"submit" field, the electronic pen client 22 will submit
the form content in accordance with instructions received

in the application description. Typically, the electronic pen client 22 will submit the form content, in the same way as a regular web browser, to a URL specified in a form tag of the application description.

5 When an action that can be handled by the electronic pen 10 itself is generated, an action procedure is initiated by the electronic pen 10 to send an action request object to the electronic pen client 22. If the electronic pen client 22 cannot translate the action into
10 a field value itself, the electronic pen client 22 further forwards the request to a base translator 28 for translating the action into a field value. In response to the action request object, an action reply object is sent from the electronic pen client 22 to the electronic pen
15 10. The action reply object contains output information that indicates to the electronic pen 10 which outputs signals to use. The output information, however, cannot be of type that the electronic pen 10 has previously indicated that it does not support. In some instances, the
20 action reply object might contain a new grid description. In such a case the electronic pen 10 will unload its current grid description and load the new grid description. Similarly, if the action reply object

contains an empty grid description, the electronic pen 10 will simply unload its current grid description.

The action request object is also sometimes used to specify actions that should be processed by the control node 24. In this instance, the electronic pen client 22 initiates a control procedure by forwarding the received action to the appropriate control node 24. As a result, the control node 24 sends an action reply object to the electronic pen client 22.

The operation of the electronic pen 10 will now be discussed in greater detail. Each electronic pen 10 has a unique pen ID, which is sent to the application server 30 when an application description is requested. The electronic pen ID allows the application to identify the particular user that is using the application and to distinguish between multiple concurrent users of the same application, such as when different electronic pens 10 are being used in connection with separate sheets of paper that each contain the same portion of the address pattern.

Referring now to FIGURE 7, there is illustrated a block diagram of the electronic pen logic that handles positions, strokes, actions, and grid descriptions for the electronic pen 10. The electronic pen 10 includes a

control block 32 for controlling the operation of the
electronic pen 10. A grid description block 34 represents
a memory location that stores a current grid description.
At any given time, the electronic pen 10 can be in either
5 of two modes. In a first mode, a grid description is
loaded, while in a second mode, the grid description block
34 is not loaded with a current grid description.

As the electronic pen 10 moves across an address
pattern, the electronic pen 10 periodically (e.g., every
10 1/100 of a second) detects a position by detecting all of
the dots within, for example, a 3mm by 3mm area. Each
detected position is forwarded (as indicated at 36) to a
position first in first out (FIFO) block 38, which acts as
a buffer for temporarily storing the detected positions.
15 The clocking of the position FIFO block 38 is controlled
by the control block 32 (as indicated at 40).

The detected position is fed from the position FIFO
block 38 (as indicated at 42) to an in grid detector 44.
The in grid detector 44 retrieves data from the grid
20 description block 34 (as indicated at 46) and determines
whether the received position is within the loaded grid
description. If not, the in grid detector 44 notifies the
control block 32, which in turn initiates a request for a

new grid. When the detected position is within the
current grid, the position is then sent (as indicated at
50) from the in grid detector 44 to a stroke engine 52.
The stroke engine 52 converts the received positions into
5 strokes, which are then sent (as indicated at 54) to an
action engine 56. A complete stroke is created when the
electronic pen 10 is lifted from the paper or when it
moves outside of the grid field where the stroke began.
Finally, the action engine 56 converts the received stroke
10 into an action that can be sent to the electronic pen
client 22. By using grid action-field-types, the action
engine knows which type of action to produce for a
specific grid field.

Referring now to FIGURE 8, there is illustrated a
15 block diagram of a state machine for the control block 32
shown in FIGURE 7. In this figure, events are indicated
in capital letters, while tasks associated with the event
are depicted in brackets. The process starts at step 60
with a start up event 62, which causes the position FIFO
20 block 38 to begin receiving detected positions.
Initially, the electronic pen 10 is in a no grid loaded
state 64, which means that the electronic pen 10 does not
have a grid loaded in the grid description block 34. As a

result, the control block 32 generates an outside grid indication 66, thereby causing the electronic pen 10 to send the request for a new grid description to the electronic pen client 22 (i.e., in accordance with the new grid procedure) and to stop the FIFO buffer 38. At this point, the electronic pen 10 enters a waiting for grid state 68.

Once the new grid has been received (as indicated at 70), the control block 32 moves to a grid loaded state 72, at which time the new grid is loaded into the grid description block 34 and the position FIFO block 38 resumes operation. On the other hand, if no grid is received (as indicated at 74), at least a portion of the positions stored in the FIFO buffer 38 are erased. Which part of the FIFO buffer to erase is determined by the grid exception area, if any, in the received empty grid description. Accordingly, all positions stored in the FIFO buffer 38 that are within the grid exception area should be erased. If no grid exception is received, the stroke associated with the position is erased. In addition, the FIFO block 38 resumes operation and the control block 32 moves into the no grid loaded state 64.

When the control block 32 is in the grid loaded state 72, a current grid is loaded in the grid description block 34. While the control block 32 remains in this state 72, the position FIFO block 38 continues to receive detected
5 positions and passes them on to the stroke engine 52 and action engine 56. Actions produced by the action engine 56 are sent (as indicated at 58) to the electronic pen client 22 (i.e., in accordance with the action procedure described above).

10 At some point, an outside grid indication 74 may be received by the control block 32 from the in grid detector 44. The outside grid event 74 causes the FIFO block 38 to stop generating new positions. In addition, the
15 electronic pen 10 enters a flushing stroke and action state 76 wherein the strokes that are currently in the stroke engine 52 and the actions that are currently in the action engine 56 are flushed to the electronic pen client 22. Once the stroke engine 52 and action engine 56 have
20 been fully flushed (as indicated at 78), the electronic pen 10 sends a request for a new grid to the electronic pen client 22 and unloads the current grid. The control block 32 then moves back into the waiting for grid state 68.

As a general matter, the electronic pen 10 may be capable of supporting various different types of output, including audio, such as warning tones; visual, such as a flashing light; tactile, such as vibration; and/or ink. In some cases, it might be desirable to allow the user of the electronic pen 10 to turn off the ink of the pen 10, such as when the electronic pen is being used on a portion of the address pattern that is public or shared or when the user wants to be able to reuse the current sheet of paper.

The electronic pen client 22 will now be described in greater detail. Generally, the electronic pen client 22 is analogous to a regular web browser. It is responsible for loading applications from application servers 30 and for handling input from the electronic pen 10.

Preferably, the electronic pen client 22 is located in a separate device from the electronic pen 10 itself. This is because it is desirable to minimize the size and power supply requirements of the electronic pen 10, which will likely be adversely affected by the processing resources and memory necessary to support the functions of the electronic pen client 22.

Referring now to FIGURE 9, there is illustrated a block diagram of a state machine for the electronic pen

client 22. Initially, the electronic pen client 22 is in a no application loaded state 80. The electronic pen client 22 recognizes only one signal when in this state 80, namely a new grid request from the electronic pen 10.

5 Such a request causes a load grid indication event 82. The electronic pen client 22 responds by sending a request to the name server 26 to translate a position contained within the new grid request into a URL where the application description can be found (i.e., in accordance with the find application location procedure). Next, the
10 electronic pen client 22 enters a waiting for application description URL state 84. If no URL for the application description can be found (as indicated at 86), the electronic pen client 22 sends a new grid reply to the
15 electronic pen 10, wherein the reply contains an empty grid description with a grid exception. As a result, the electronic pen client 22 returns to the no application loaded state 80.

If a URL for the application description is received
20 from the name server 26 (as indicated at 88), the electronic pen client 22 sends a request to the application server 30 to retrieve the application description (i.e., in accordance with the get application

description procedure). Accordingly, the electronic pen client 22 enters a waiting for application description state 90.

5 If the electronic pen client 22 does not receive an application description from the application server 30 (as indicated at 92), a new grid reply is sent by the electronic pen client 22 to the electronic pen 10 wherein the reply contains an empty grid. Thus, the electronic pen client 22 returns to the no application loaded state 10 80. If, however, the electronic pen client 22 does receive an application description from the application server 30 (as indicated at 94), the electronic pen client 22 sends a new grid reply to the electronic pen 10 containing a new grid description, and the electronic pen 15 client 22 loads the application in its memory. In addition, the electronic pen client 22 moves into an application loaded state 96.

In the application loaded state 96, five types of actions can be received by the electronic pen client 22 20 from the electronic pen 10. First, a received action can include a request that the electronic pen client 22 cannot handle itself, in which case the electronic pen client 22 will send the action to the base translator 28 (as

indicated at 98). The electronic pen client 22 then moves into a waiting for response from the base translator state 100. Once a base translator response 102 is received by the electronic pen client 22, the electronic pen client 22
5 updates a current form or other data associated with the currently loaded application and sends an action reply to the electronic pen 10 with appropriate output information.

Another type of action that the electronic pen client 22 can receive from the electronic pen 10 is a request
10 that should be forwarded to a control node 24. In such a case, the action is sent to a control URL specified in the application description (as indicated at 104), and the electronic pen client 22 enters a waiting for response from the control state 106. Once a response is received
15 from the control (as indicated at 108), the electronic pen client 22 sends an action reply to the electronic pen 10 with appropriate output information.

A third type of action is a submit form request, in response to which the electronic pen client 22 will submit
20 the current form to the application server 30 that is identified by the URL in the application description (as indicated at 110). The electronic pen client 22 then enters a waiting for response from the application server

state 112. If the application server 30 responds by
sending an empty application description to the electronic
pen client 22 (as indicated at 114), the current
application is unloaded from the electronic pen client 22
5 and an action reply is sent to the electronic pen 10 with
an empty grid. As a result, the electronic pen client 22
returns to the no application loaded state 80. On the
other hand, if the application server 30 responds with a
non-empty application description, the old application is
10 unloaded from the electronic pen client 22, the new
application description is parsed and loaded in the
electronic pen client 22, an action reply is sent to the
electronic pen 10 with a new grid description and with
appropriate output information, and finally the electronic
15 pen client 22 returns to the application loaded state 96.

A fourth type of action that can be received by the
electronic pen client 22 from the electronic pen 10 is a
request to load a new grid. This action occurs, for
example, when a position outside of the current grid is
20 detected by the electronic pen 10. When a new grid
request is received, the electronic pen client 22 sends a
request to the name server 26 (as indicated at 116) and

the electronic pen client 22 returns to the waiting for application description URL state 84.

5 Finally, a fifth type of action that can be received by the electronic pen client 22 is an action that the electronic pen client 22 can handle itself, in which case the electronic pen client 22 updates the current form and sends an action reply to the electronic pen 10 with appropriate output information (as indicated at 118). The electronic pen client 22 then remains in the application loaded state 96. One type of action that the electronic pen client 22 might be able to handle itself is a local application. For example, the electronic pen client 22 might be capable of performing certain basic functions that are defined by a local application. Thus, when the electronic pen client 22 receives a new grid request, the position associated with the new grid request can be analyzed to determine if it corresponds to a local application. If so, the electronic pen client 22 can load the application description from its local memory, send a new grid description to the electronic pen 10 without having to communicate with the name server 26 or the application server 30.

Another action that might be handled locally by the electronic pen client 22 relates to the selection of fields within a form. When the electronic pen client 22 receives an action, the field that corresponds to that action receives focus. When this occurs, the electronic pen client 22 might display the field's value on its display or output the value by audio. In addition, the electronic pen client 22 might allow the user to edit the value of the field by means other than the electronic pen 10. Yet another type of action that might be handled by the electronic pen client 22 itself are actions that relate to a clipboard function. When a "copy" field is selected, the value of the field that had focus at the time the copy field was selected is transferred to the clipboard. Similarly, when a "paste" field is selected, the value stored in the clipboard is transferred to the field that had focus at the time the paste field was selected.

Referring now to FIGURES 10A through 10C, there is shown, by way of example, a message flow and signaling diagram illustrating the operation of the electronic pen system 2 depicted in and discussed in connection with FIGURE 2. Initially, the electronic pen 10 detects a

first position on the address pattern at step 120 (e.g.,
at a location on a sheet of paper designated for composing
and sending emails). At this stage, it is assumed that
the electronic pen 10 is in a no grid loaded state. Thus,
5 in response to the detection of the first position, the
electronic pen 10 sends a new grid request 122, which
contains the detected position information, to the
electronic pen client 22. As a result, the electronic pen
client 22 sends an application location request 124
10 containing the detected position information to the name
server 26, at step 126. The name server 26 translates the
detected position into a URL where an application
description that corresponds to the detected position can
be found (e.g., a URL address for a server containing an
15 email application), and returns an application location
reply 128 containing the retrieved URL to the electronic
pen client 22.

The electronic pen client 22 then sends an
application description request 130, which contains the
20 unique pen ID for the electronic pen 10, to the
application server 30. The application server 30
retrieves the application description at step 132 and
sends an application description reply 134 containing the

retrieved application description to the electronic pen client 22. The electronic pen client 22 then parses and stores the application description at step 136. This step further involves generating a current grid description
5 from the application description and sending the grid description to the electronic pen 10 in a new grid reply 138. The electronic pen 10 stores the received grid description at step 140 and resumes processing of the detected positions. Using the detected positions and the
10 information in the grid description (e.g., so that the electronic pen 10 knows which fields of the email form are being filled in), the electronic pen 10 generates strokes at step 142 and generates actions at step 144 using the stroke engine 52 and action engine 56 shown in FIGURE 7.

15 Each time an action is generated that cannot be handled by the electronic pen 10 itself, an action request 146 containing a description of the action is sent from the electronic pen 10 to the electronic pen client 22. At this point, the electronic pen client 22 should determine
20 what type of action has been received so that it can respond to the action in an appropriate manner. First, it is determined whether the action requires the attention of, or otherwise should be processed in accordance with, a

local application at step 148. Very basic applications or frequently used applications (e.g., delete entered text), for example, might be stored locally to avoid having to contact another entity. In such a case, the electronic pen client 22 retrieves the local application at step 150 and sends an action reply 152, which can contain a new grid description or other appropriate information.

However, if it is determined at step 148 that the received action does not relate to a local application, the process continues at step 154 where it is determined whether the received action requires processing by an external translator (e.g., handwriting recognition). If so, an action request 156 containing a description of the action is sent by the electronic pen client 22 to the base translator 28. The base translator 28 processes the action at step 158 and sends an action reply 160 containing output information responsive to the received action (e.g., text corresponding to written characters) to the electronic pen client 22, which can forward the output information to the electronic pen 10 in an action reply 162, if necessary.

If it is determined at step 154 that the received action does not require processing by an external

translator, it is next determined whether the action
relates to a control application at step 164. If so, an
action request 166 containing a description of the action
is sent by the electronic pen client 22 to the control
5 server 24. The control server 24 processes the received
action at step 168 and, if a response is necessary,
returns output information responsive to the received
action in an action reply 170, which is forwarded from the
electronic pen client 22 to the electronic pen 10 in an
10 action reply 172.

Assuming that it is determined at step 164 that the
received action does not relate to a control function, it
is next determined whether the action comprises a request
to submit a form at step 174 (e.g., a selection of a
15 "send" area on the email form). If so, an action request
176 containing the data entered onto the form is sent by
the electronic pen client 22 to the application server 30.
The application server 30 processes the form at step 178
and sends an action reply 180 containing a new application
20 description (or an empty application description) to the
electronic pen client 22. The electronic pen client 22
parses and stores the new application description at step
182 and generates a new grid description from the newly

received application description. The electronic pen client 22 then sends an action reply 184 containing the new grid description. Although not illustrated in the figure, the electronic pen 10 will typically respond to the receipt of a new grid description by unloading its current grid description and loading the new grid description into its memory.

At some point, it is assumed that the electronic pen 10 detects a position that is outside of the currently loaded grid at step 186. In response to such an event, the electronic pen 10 sends a new grid request 188 containing the newly detected position data to the electronic pen client 22. In response, the electronic pen client 22 again generates an application location request 190 containing the detected position data and sends the request to the name server 26. The name server 26 determines whether a URL for an application description that corresponds to the newly detected position is available at step 192.

If so, the name server 26 sends an application location reply 194 containing a retrieved URL to the electronic pen client 22, which in turn sends an application description request 196 containing the unique

pen ID for the electronic pen 10 to the application server
30 at the identified URL address, just as previously
discussed in connection with messages 128 and 130. In
this case, however, it is assumed that the application
5 server 30 determines that the requested application
description is unavailable at step 198. As a result, the
application server 30 sends an application description
reply to the electronic pen client 22 containing an empty
application description. In response to the receipt of an
10 empty application description, the electronic pen client
22 unloads the current application at step 202 and sends a
new grid reply 204 containing an empty grid description to
the electronic pen 10. The electronic pen 10 responds to
the receipt of the empty grid description by unloading the
15 current grid description at step 206.

Another possibility is that the name server 26
determines at step 192 that a URL corresponding to the
detected position is not available. In this situation,
the name server 26 sends an application location reply 208
20 to the electronic pen client 22. The reply 208 may simply
be empty to indicate that a URL is not available.
Preferably, however, the reply 208 contains a grid
exception defining the largest area possible around the

detected position for which there is no corresponding URL.
In response to the reply 208, the electronic pen client 22
sends a new grid reply 210 containing an empty grid
description with a grid exception. Upon receiving the
5 reply 210, the electronic pen 10 unloads the current grid
description at step 212. Furthermore, assuming that the
electronic pen 10 receives and recognizes the grid
exception information, the electronic pen 10 may
subsequently be able to determine that certain detected
10 positions on the address pattern are not associated with
any application without having to send a request to the
name server 26 or the application server 30.

As demonstrated by the foregoing text, the electronic
pen 10 can be adapted to perform a wide variety of
15 functions. To facilitate use of the electronic pen 10 in
connection with different applications and functions, it
is desirable that the user of the electronic pen 10 can
customize a configuration of the electronic pen 10.
However, because the electronic pen 10 is not designed to
20 accept input data (i.e., the electronic pen 10 does not
include typical MMI mechanisms, such as keys and
displays), there is no clear way to input configuration
data to the electronic pen 10. To satisfy the needs and

preferences of the electronic pen user, there should be some mechanism for allowing the user to set certain fundamental parameters. In addition, it will frequently be desirable for the electronic pen 10 to enter into a
5 locked mode after the electronic pen 10 is switched off or powered down. Thus, there also needs to be a way to unlock the electronic pen 10 upon being powered up.

In accordance with the present invention, the electronic pen 10 includes an application that recognizes
10 certain areas of the address pattern as setting areas. By using the electronic pen 10 in connection with a paper that is formatted for entry of settings data, the settings software, which might alternatively be located in the electronic pen client 22, can be used to process user
15 specified settings data. The formatted settings paper can be included, for example, as part of a users manual for the electronic pen 10 product and can be delivered in several copies to allow for multiple reconfigurations.

Referring now to FIGURE 11, there is illustrated a
20 block diagram of the electronic pen 10 for use in configuring the electronic pen 10 in accordance with one possible embodiment of the present invention. The electronic pen 10 includes a reading sensor 220 that

detects portions of the address pattern and forwards the detected information to a processor 222. The processor 222, using a local settings application 226, recognizes the detected portion of the address pattern as being
5 within a predefined settings area. The processor 222 can then translate positional data received from the reading sensor 220 into settings information using the local settings application 226 and a handwriting recognition application 228. The selected settings can then be stored
10 in a local settings memory 224. The configuration settings might include such information as a URL or IP address for use in addressing a desired modem, cell phone, and/or internet server, the timer setting for delivering alert signals, a time out setting for powering down the
15 electronic pen 10, a user personal identification number (PIN) code, a user name, or any other settings or configuration information. The processor 222 could further contact a server at a selected IP address using a Bluetooth™ transceiver 230.

20 Referring now to FIGURE 12, there is illustrated an example of an electronic pen setting form 232 that can be included as a page in the electronic pen user manual and that can be used for configuring the electronic pen 10.

When the electronic pen 10 is powered up for the first time, the electronic pen 10 is essentially "functionless" because no configuration has been made. By touching the pen to a special "configure pen" box 234 the electronic pen 10 recognizes the address pattern within the configure pen box 234, and the electronic pen software enters into a configuration mode in which the electronic pen 10 initiates a simple alphanumeric character recognition application (e.g., JOT). The electronic pen 10 can then be used to enter a four digit PIN number in a select PIN field 236. The handwritten PIN is recognized using the character recognition software and beeps are preferably used to acknowledge recognition. For example, a single beep can be used to acknowledge the first digit, a double beep can be used to acknowledge the second digit, and so on. Alternatively, a number of beeps can be used to acknowledge the inputted digit value. For example, three beeps correspond to an entered value of three. Next, the user can select an IP or URL address by writing the address or an associated code in a select IP field 238. Again, beeps can be used to acknowledge recognition of the entered information. Finally, the electronic pen 10 can be used to select an established connection box 240 to

initiate communications with the selected IP or URL address. As an alternative to the use of character recognition software, the electronic pen setting form 232 can instead include a plurality of boxes each
5 corresponding to a different alphanumeric character. By touching the electronic pen 10 within particular boxes, a portion of the address pattern contained in each particular box is detected and a selection of the associated alphanumeric character is made. Each
10 individual selection can again be acknowledged by one or more beeps.

Referring now to FIGURE 13, there is illustrated a system 242 for use in establishing a connection after selection of the established connection box 240 shown in
15 FIGURE 12. The electronic pen 10 first contacts a mobile phone 14 via a Bluetooth™ interface 244. Alternatively, other types of wireless technology, such as infrared signalling or inductive coupling, or wired technology, such as a cable connection can be used. The mobile phone
20 14, in turn, transmits a request for connection via an air interface 18 to a base station 20. The base station 20 forwards the request over a GSM and/or general packet radio service (GPRS) network 246 to a smart paper

administrator server 248 located in an address that is
preprogrammed in the pen. The smart paper administrator
server 248 recognizes the IP or URL address selected
during the initial configuration procedure and reroutes
5 the connection to a pen user server 250 located at the
selected IP or URL address. The configuration information
can then be downloaded to the pen user server 250 from the
electronic pen 10 and a beep acknowledgment can be
delivered back to the electronic pen 10 via the GSM and/or
10 GPRS network 246, the air interface 18, and the Bluetooth™
interface 244. At this point, the configuration of the
electronic pen 10 is complete, and the electronic pen 10
can only be reconfigured by the owner of the electronic
pen 10 and his associated manual once the owner has
15 correctly filled in the electronic pen settings form 232
in the legally purchased manual.

After the initial configuration, the user of the
electronic pen 10 can log in using any addressed paper or
other addressed surface. Such as login can be more
20 sophisticated because the configured electronic pen 10 can
automatically access an authorized support server (i.e.,
the pen user server 250). For example, to ensure that the
electronic pen 10 is used only by an authorized user, the

electronic pen 10 can be placed in a locked state each time it is powered down. To unlock the electronic pen 10 upon power up, the support server can be used to recognize the user's handwritten signature or PIN.

5 In accordance with the invention, the setting functionality is conveniently built into the electronic pen 10. In other words, the normal functionality of the electronic pen 10 is used for configuration (i.e., handwriting on an addressed surface operates as the
10 electronic pen's MMI). Furthermore, configuration of the electronic pen 10 is restricted to the owner of the electronic pen 10 because the original manual is needed for configuration. The scheme prevents unauthorized use and deters theft of the electronic pen 10.

15 Although various preferred embodiments of the method and apparatus of the present invention have been illustrated in the accompanying Drawings and described in the foregoing Detailed Description, it is understood that the invention is not limited to the embodiments disclosed,
20 but is capable of numerous rearrangements, modifications, and substitutions without departing from the spirit of the invention as set forth and defined by the following claims. Furthermore, it shall be understood that the

terms "comprises" and "comprising," when used in the
foregoing Detailed Description and the following claims,
specifies the presence of stated features, elements,
steps, or components but does not preclude the presence or
5 addition of one or more other features, elements, steps,
components, or groups thereof.

WHAT IS CLAIMED IS:

1 1. An electronic reading device, comprising:
2 a reading sensor for detecting a portion of an
3 address pattern on a formatted surface;
4 a processor for identifying the detected portion
5 of the address pattern as being within an electronic
6 reading device configuration area and for converting
7 position data received from the reading sensor into a
8 configuration setting.

1 2. The electronic reading device of claim 1,
2 wherein the electronic reading device configuration area
3 comprises an electronic reading device configuration form.

1 3. The electronic reading device of claim 1,
2 further comprising a memory for storing the configuration
3 setting.

1 4. The electronic reading device of claim 1,
2 wherein the processor converts the position data into the
3 configuration setting using a configuration application.

1 5. The electronic reading device of claim 1,
2 wherein the position data corresponds to handwritten
3 information written with the electronic reading device,
4 the conversion of the position data into the configuration
5 setting performed using handwriting recognition.

1 6. The electronic reading device of claim 5,
2 wherein the handwritten information is entered in a field
3 of the electronic reading device configuration area that
4 corresponds to the configuration setting.

1 7. The electronic reading device of claim 1,
2 wherein the position data is associated with at least one
3 of a plurality of fields, the processor operating to
4 convert a detection of a portion of the address pattern
5 within the at least one of the fields into a configuration
6 setting corresponding to the at least one field.

1 8. The electronic reading device of claim 7,
2 wherein each of the plurality of fields corresponds to a
3 different alphanumeric character.

1 9. The electronic reading device of claim 1,
2 wherein the configuration setting comprises an
3 identification code.

1 10. The electronic reading device of claim 1,
2 wherein the configuration setting represents an address of
3 a server used for authenticating configuration of the
4 electronic reading device.

1 11. The electronic reading device of claim 1,
2 further comprising a transmitter for transmitting the
3 configuration setting to a support server.

1 12. The electronic reading device of claim 1,
2 wherein the transmitter transmits information via one of a
3 cable and a local wireless link.

1 13. A system for initializing an electronic reading
2 device, comprising:

3 a formatted surface having an address pattern,
4 wherein a position relative to the address pattern can be
5 determined from an examination of a portion of the address
6 pattern;

7 an electronic reading device including a reading
8 sensor for detecting portions of the address pattern; and

9 a processor for translating detected portions of
10 the address pattern into at least one alphanumeric
11 character.

1 14. The system of claim 13, wherein the detected
2 portions of the address pattern correspond to at least one
3 handwritten character written with the electronic reading
4 device on the formatted surface, the processor translating
5 the detected portions of the address pattern into the at
6 least one alphanumeric character.

1 15. The system of claim 13, further comprising a
2 server for storing the at least one alphanumeric
3 character.

1 16. The system of claim 13, further comprising a
2 server for comparing the at least one alphanumeric
3 character with a stored identification code.

1 17. The system of claim 16, wherein the server
2 enables a use of the electronic reading device when the at
3 least one alphanumeric character matches the stored
4 identification code.

1 18. The system of claim 16, wherein the electronic
2 reading device communicates with the server via a local
3 wireless link interface.

1 19. The system of claim 16, wherein the electronic
2 reading device communicates with the server using one of
3 an infrared signal, inductive coupling, and a cable
4 connection.

1 20. A method for configuring an electronic reading
2 device, comprising the steps of:

3 detecting at least one position of the
4 electronic reading device relative to an address pattern
5 on a formatted surface;

6 determining that the at least one detected
7 position relates to an entry of configuration data;

8 converting the at least one detected position
9 into a configuration setting; and

10 storing the configuration setting.

1 21. The method of claim 20, wherein the step of
2 determining that the at least one detected position
3 relates to an entry of configuration data comprises
4 identifying a portion of the address pattern adjacent to
5 the electronic reading device as corresponding to a
6 configuration entry form.

1 22. The method of claim 20, wherein the step of
2 converting comprises performing handwriting recognition.

1 23. The method of claim 20, wherein the
2 configuration setting comprises a user identifier, further
3 comprising the steps of:
4 detecting a data entry subsequent to the step of
5 storing, said data entry made with the electronic reading
6 device on a surface having an address pattern;
7 comparing the data entry with the stored user
8 identifier; and
9 enabling the electronic reading device if the
10 data entry corresponds to the stored user identifier.

1 24. A system for unlocking an electronic reading
2 device, comprising:

3 a formatted surface having an address pattern,
4 wherein a position relative to the address pattern can be
5 determined from an examination of a portion of the address
6 pattern;

7 an electronic reading device including a reading
8 sensor for detecting portions of the address pattern; and

9 a first processor for translating detected
10 portions of the address pattern into a data entry; and

11 a second processor for comparing the data entry
12 to a stored user identifier and for enabling the
13 electronic reading device if the data entry corresponds to
14 the stored user identifier.

1 25. The system of claim 24, wherein the first
2 processor and the second processor are the same processor.

1 26. The system of claim 24, wherein the first
2 processor performs said translation using character
3 recognition.

1 27. The system of claim 24, wherein the data entry
2 and the stored user identifier represent a handwritten
3 signature.

1 28. The system of claim 24, wherein the data entry
2 and the stored user identifier represent a personal
3 identification number.

1 29. A method for unlocking an electronic reading
2 device, comprising the steps of:
3 detecting a plurality of positions of an
4 electronic reading device relative to an address pattern
5 on a formatted surface;
6 converting the plurality of detected positions
7 into a data entry;
8 comparing the data entry with a stored user
9 identifier; and
10 enabling the electronic reading device based on
11 the comparison if the data entry corresponds to the stored
12 user identifier.

1 30. The method of claim 29, wherein the step of
2 converting comprises performing handwriting recognition.

1 31. The method of claim 29, wherein the data entry
2 and the stored user identifier represent a handwritten
3 signature.

1 32. The method of claim 29, wherein the data entry
2 and the stored user identifier represent a personal
3 identification number.

ABSTRACT OF THE DISCLOSURE

A method and system for configuring and unlocking an electronic reading device utilizes a reading sensor for detecting a portion of an address pattern on a formatted surface. In particular, the address pattern on the surface is formatted such that a position on the address pattern can be determined by detecting only a small portion of the address pattern. A processor identifies whether the detected position of the address pattern is within an electronic reading device configuration area and, if so, converts position data received from the reading sensor into a configuration setting for the electronic reading device. The conversion can be performed, for example, by translating the detected position(s) into an alphanumeric character. The configuration setting is then stored in the electronic reading device and/or in a server associated therewith. Alternatively, instead of converting detected positions into a configuration setting, detected positions can be converted into an unlocking code (e.g., a PIN or signature), which is then compared with a stored user identifier. If a match occurs, the electronic reading device is enabled or unlocked.

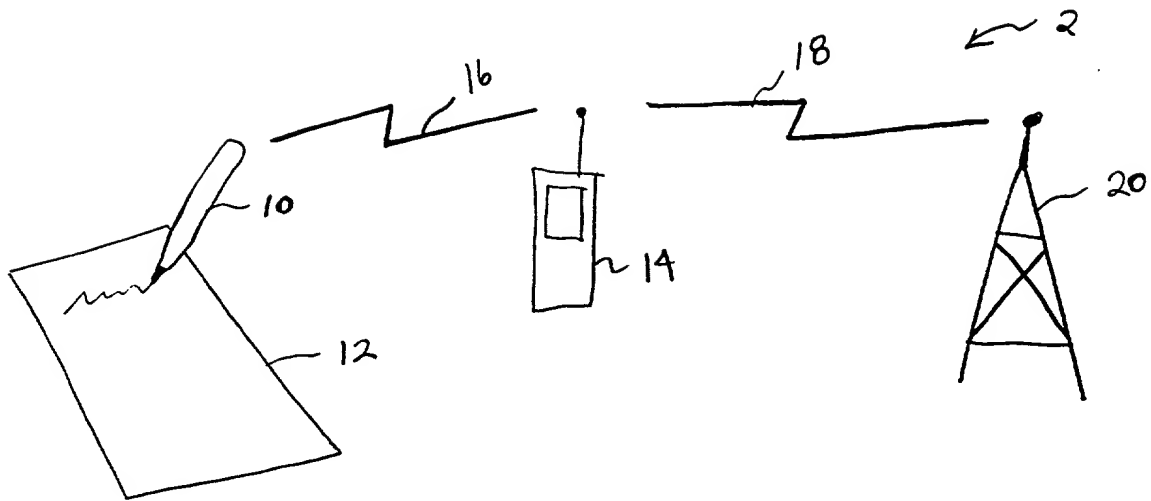


FIG. 1

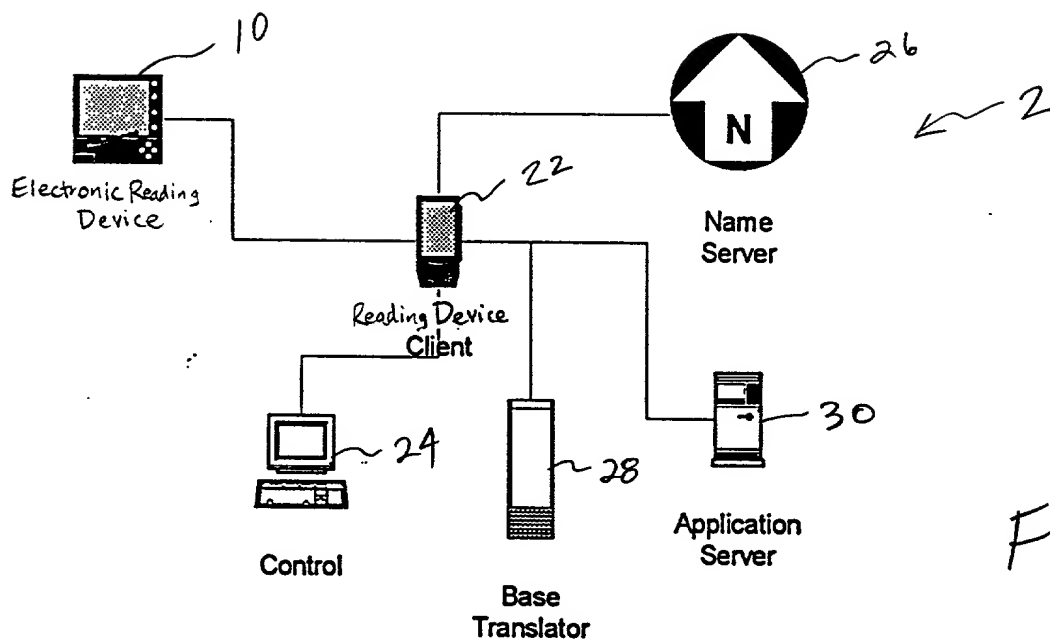


FIG. 2

09703354 103100

Electronic Pen
WSP Client
(WTP)
UDP/IP
...

Electronic Client Pen
WSP Server
(WTP)
UDP/IP
...

FIG. 3

Electronic Pen
WSP Client
(WTP)
UDP/IP
...

WAP GW	
WSP GW	HTTP Client
(WTP)	
UDP/IP	TCP/IP
...	...

Electronic Client Pen
HTTP Server
TCP/IP
...

FIG. 4

Client
WSP Client
(WTP)
UDP/IP
...

WAP GW	
WSP GW	HTTP Client
(WTP)	
UDP/IP	TCP/IP
...	...

Supporting Entity
HTTP Server
TCP/IP
...

FIG. 5

Client
HTTP Client
TCP/IP
...

Supporting Entity
HTTP Server
UDP/IP
...

FIG. 6

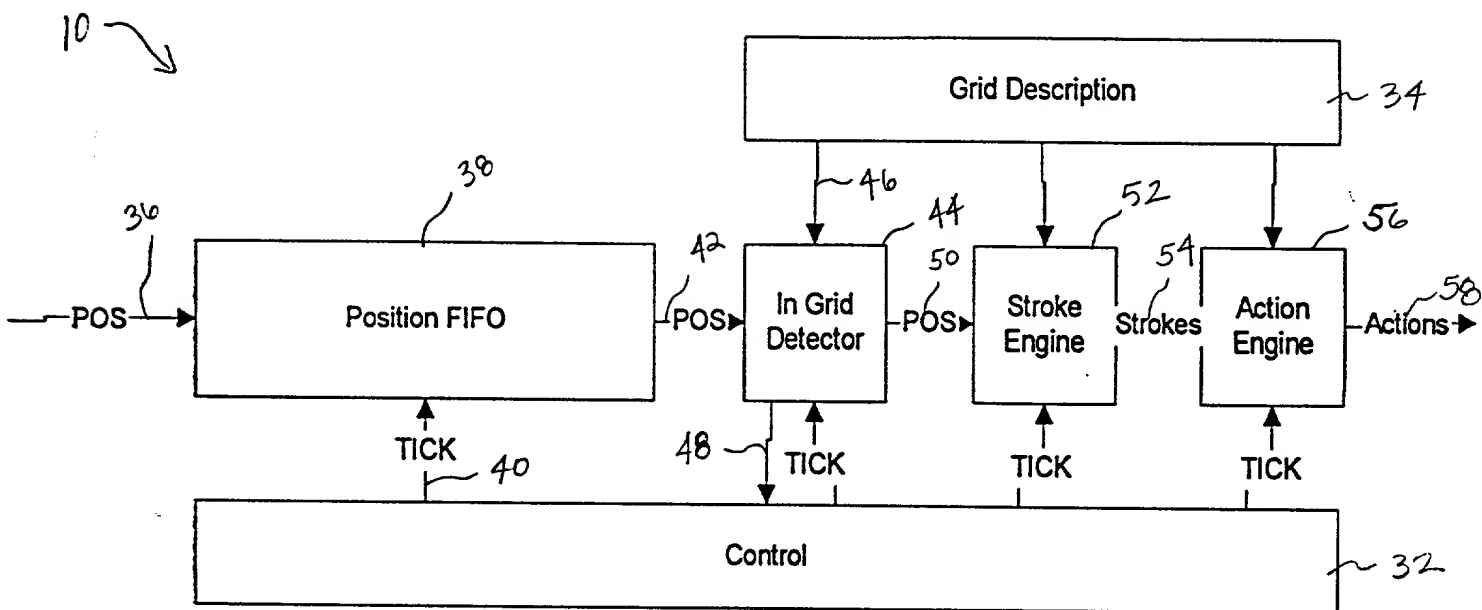


FIG. 7

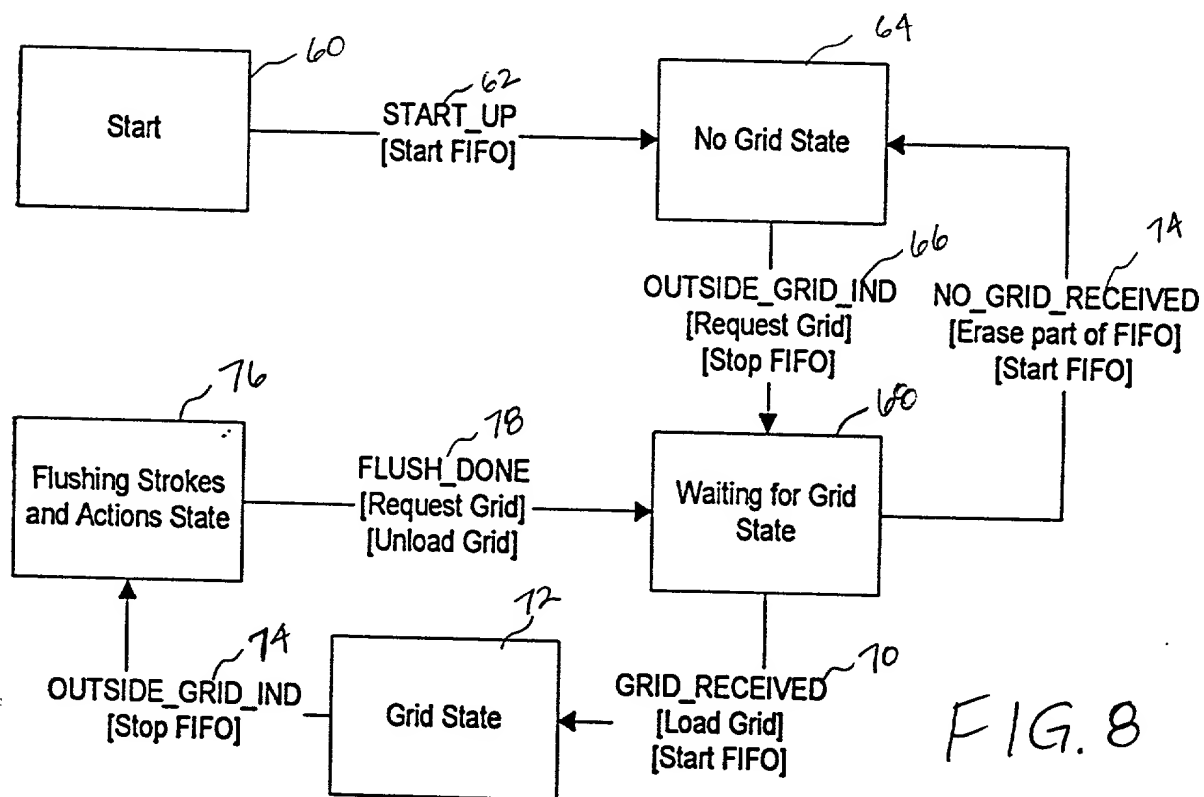
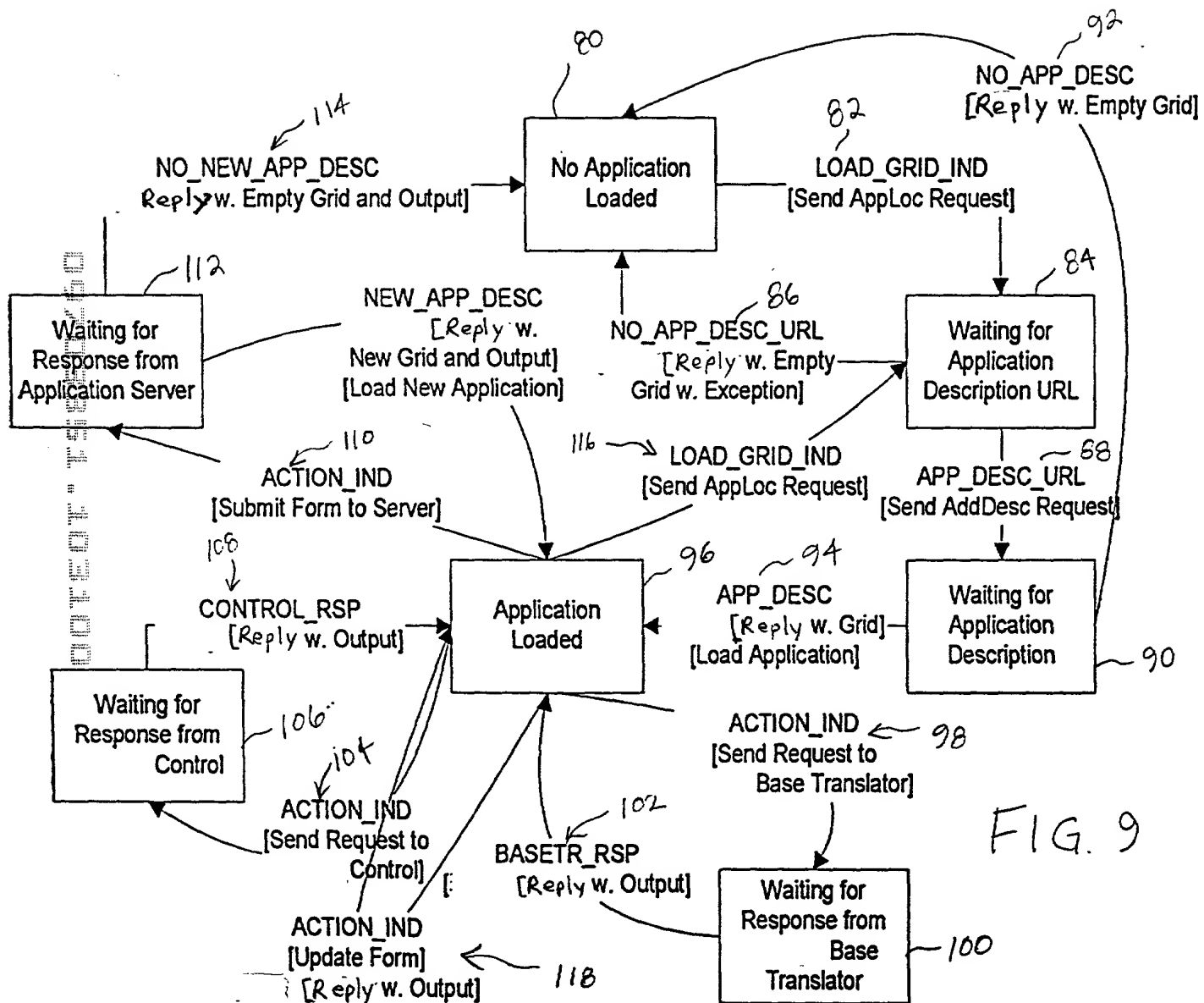


FIG. 8



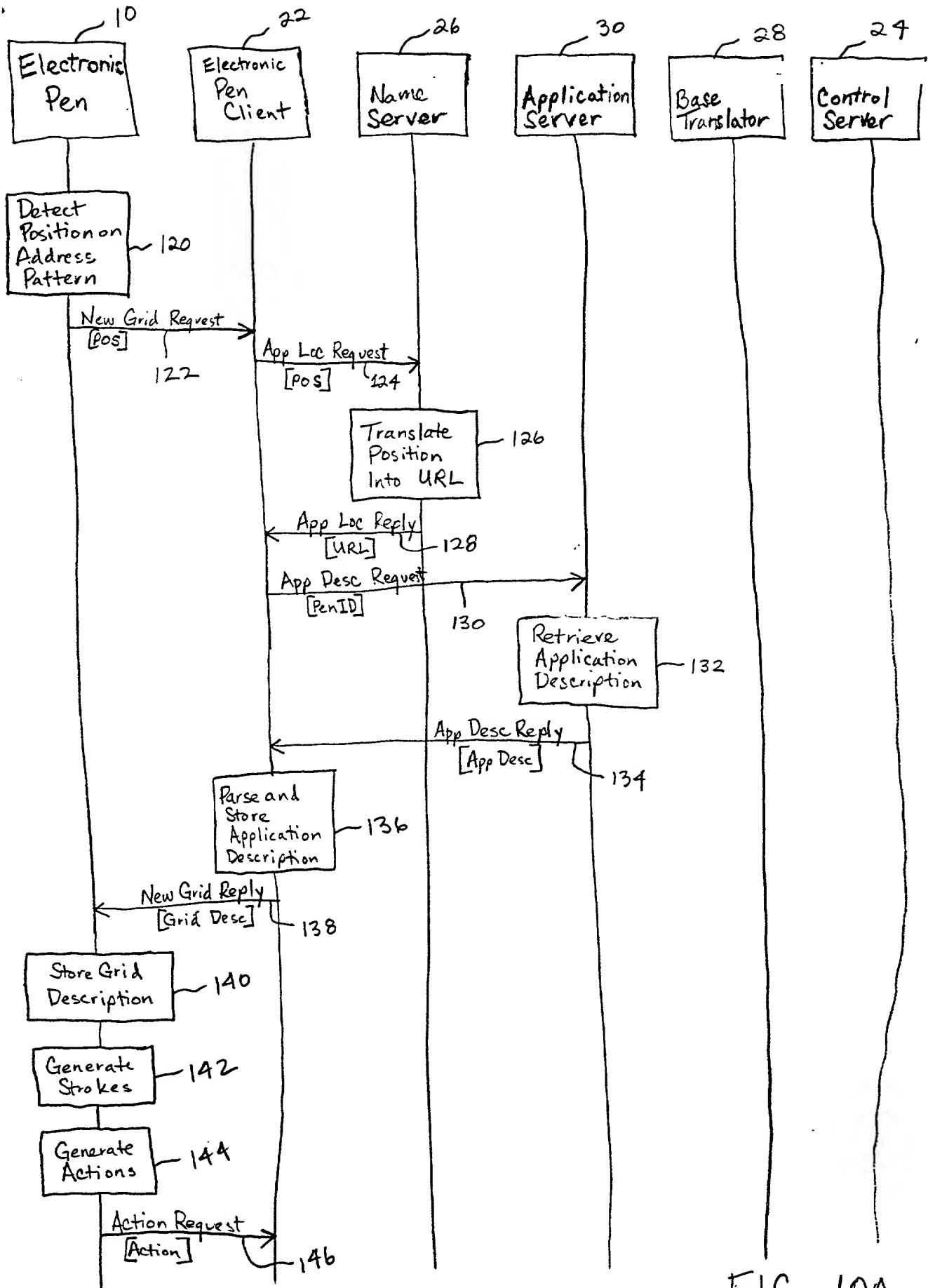


FIG. 10A

09703364-10100

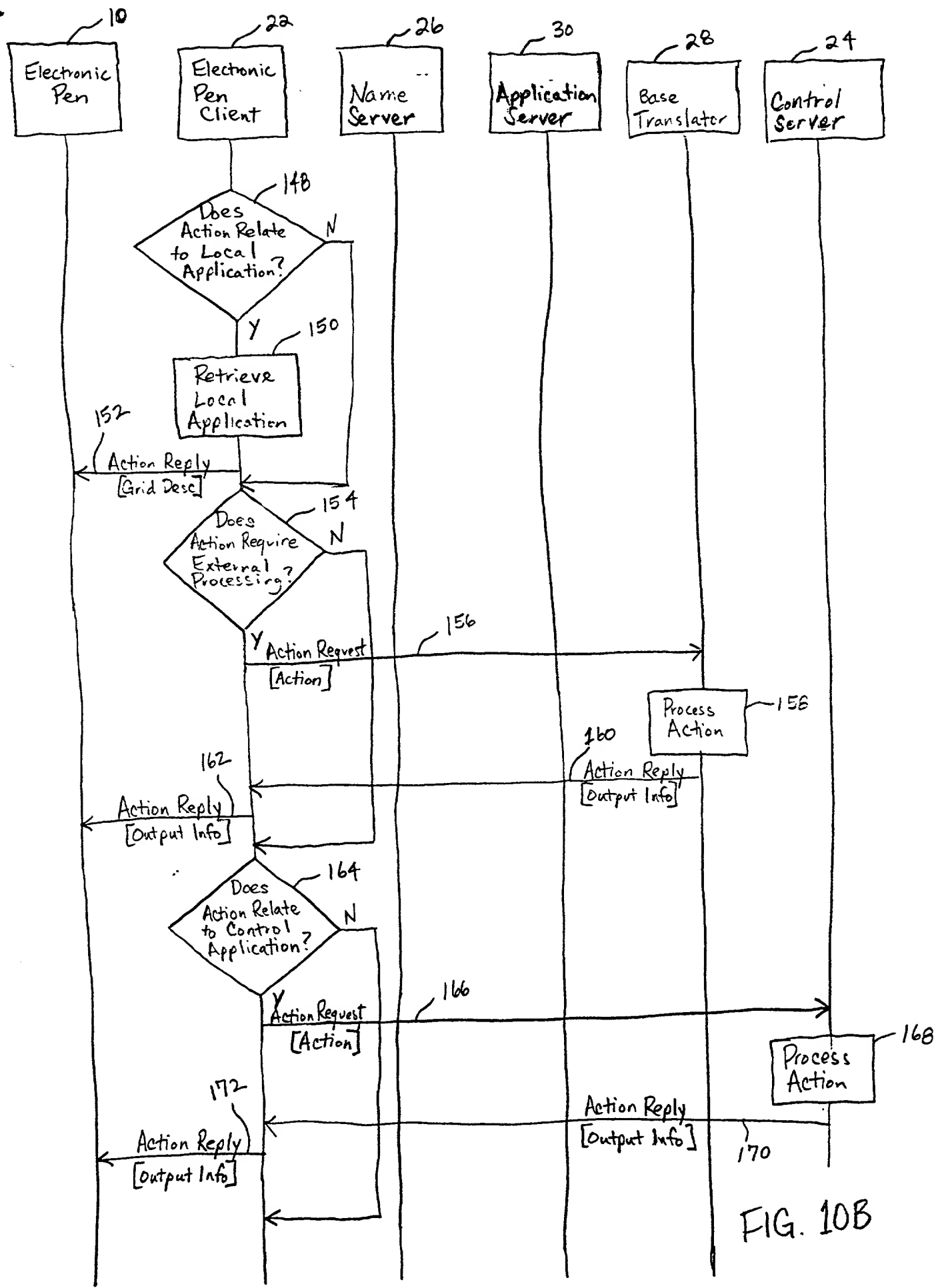


FIG. 10B

DOT TEST 10100

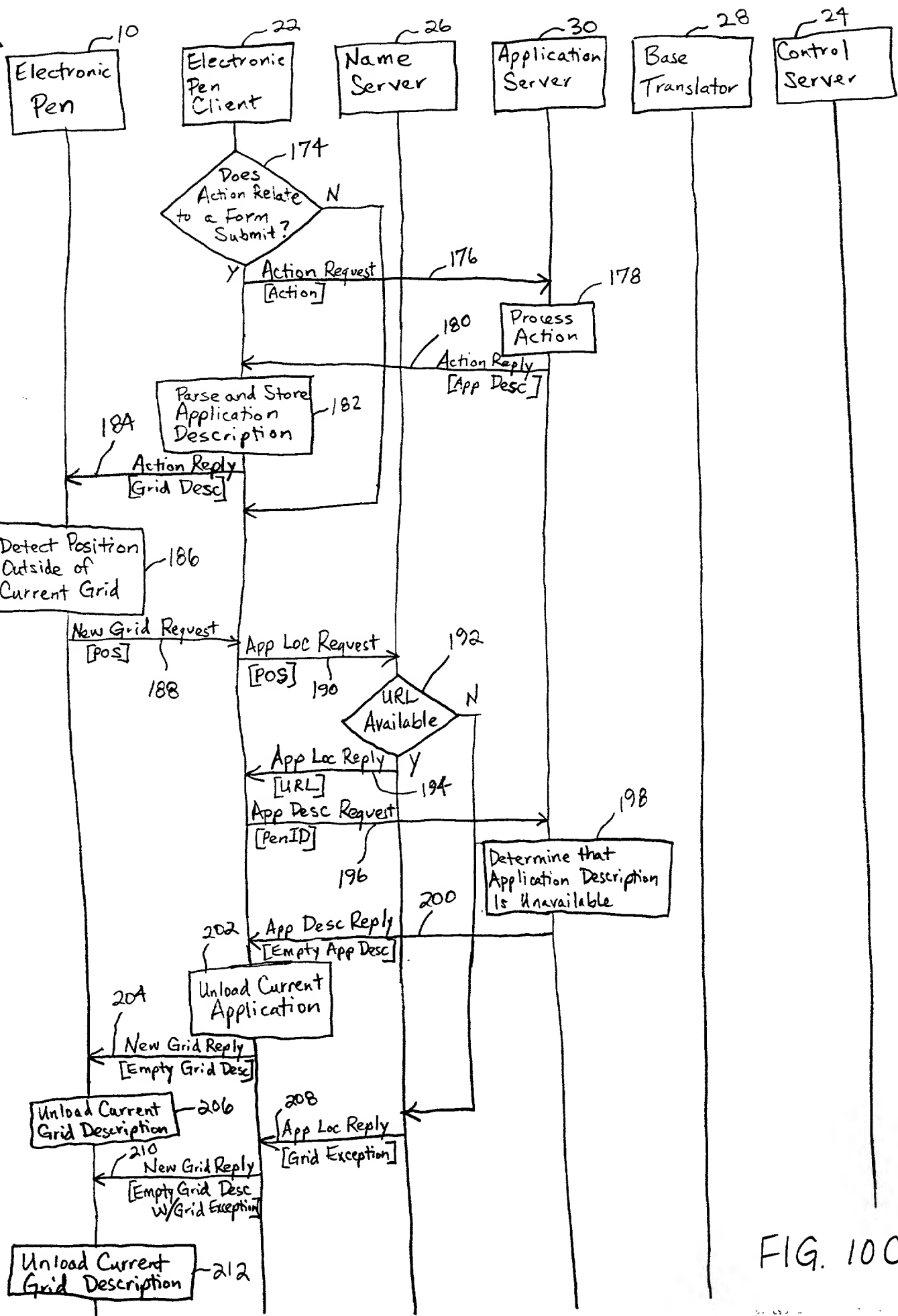


FIG. 10C

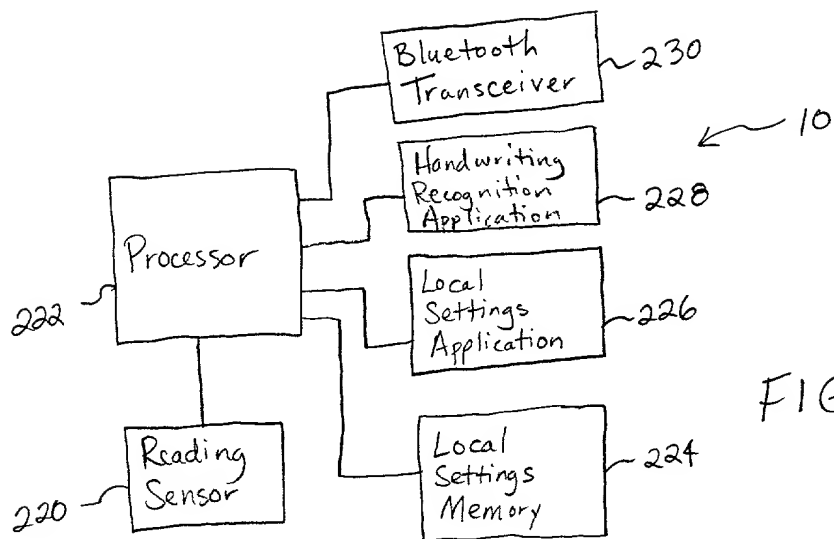


FIG. 11

(Page in manual)

236

238

FIG. 12

FIG. 13

Smart Paper Administrator Server

**RULES 63 AND 67 (37 C.F.R. 1.63 and 1.67)
DECLARATION AND POWER OF ATTORNEY**

FOR UTILITY/DESIGN/CIP/PCT NATIONAL APPLICATIONS

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; and

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: METHOD AND SYSTEM FOR CONFIGURING AND UNLOCKING AN ELECTRONIC READING DEVICE, the specification of which: (mark only one)

- ___ (a) is attached hereto.
___ (b) was filed on ___ as Application Serial No. ___ and was amended on ___ (if applicable)
___ (c) was filed as PCT International Application No. PCT/___ on ___ and was amended on ___ (if applicable).
___ (d) was filed on ___ as Application Serial No. ___ and was issued a Notice of Allowance on _____.
X (e) was filed on October 31, 2000 and bearing attorney docket number 34650-604PT.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above or as allowed as indicated above.

I acknowledge the duty to disclose all information known to me to be material to the patentability of this application as defined in 37 CFR § 1.56. If this is a continuation-in-part (CIP) application, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability of the application as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

I hereby claim foreign priority benefits under 35 U.S.C. § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application

on which my priority is claimed or, (2) if no priority is claimed, before the filing date of this application:

PRIOR FOREIGN PATENTS

<u>Number</u>	<u>Country</u>	<u>Month/Day/Year</u> <u>Filed</u>	<u>Date first</u> <u>laid-open or</u> <u>Published</u>	<u>Date</u> <u>patented or</u> <u>Granted</u>	<u>Priority Claimed</u> <u>Yes</u> <u>No</u>
NONE					

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATIONS

<u>Application No. (series code/serial no.)</u>	<u>Month/Day/Year Filed</u>
60/182,742	February 16, 2000
60/190,343	March 16, 2000
60/192,662	March 28, 2000

I hereby claim the benefit under 35 U.S.C. § 120/365 of any United States application(s) listed below and PCT international applications listed above or below:

PRIOR U.S. OR PCT APPLICATIONS

<u>Application No. (series code/serial no.)</u>	<u>Month/Day/Year Filed</u>	<u>Status(pending, abandoned, patented)</u>
NONE		

I hereby appoint:

TIMOTHY G. ACKERMANN, Reg. No. 44,493	GERALD H. GLANZMAN, Reg. No. 25,035	DANIEL G. NGUYEN, Reg. No. 42,933
BENJAMIN J. BAI, Reg. No. 43,481	J. KEVIN GRAY, Reg. No. 37,141	SPENCER C. PATTERSON, Reg. No. 43,849
MICHAEL J. BLANKSTEIN, Reg. No. 37,097	STEVEN R. GREENFIELD, Reg. No. 38,166	RUSSELL N. RIPPAMONTI, Reg. No. 39,521
MARY JO BOLDINGH, Reg. No. 34,713	JOSHUA A. GRISWOLD, Reg. No. 46,310	ROSS T. ROBINSON, Reg. No. 47,031
MARGARET A. BOULWARE, Reg. No. 28,708	J. PAT HEPTIG, Reg. No. 40,643	STEPHEN G. RUDISILL, Reg. No. 20,087
ARTHUR J. BRADY, Reg. No. 42,356	SHARON A. ISRAEL, Reg. No. 41,867	HOLLY L. RUDNICK, Reg. No. 43,065
MATTHEW O. BRADY, Reg. No. 44,554	JOHN R. KIRK JR., Reg. No. 24,477	J.L. JENNIE SALAZAR, Reg. No. 45,065
DANIEL J. BURNHAM, Reg. No. 39,618	PAUL R. KITCH, Reg. No. 38,206	KEITH W. SAUNDERS, Reg. No. 41,462
THOMAS L. CANTRELL, Reg. No. 20,849	TIMOTHY M. KOWALSKI, Reg. No. 44,192	JERRY R. SELINGER, Reg. No. 26,582
RONALD B. COOLLEY, Reg. No. 27,187	JAMES F. LEA III, Reg. No. 41,143	ZACHARY J. SMOLINSKI, Reg. No. 47,100
THOMAS L. CRISMAN, Reg. No. 24,846	HSIN-WEI LUANG, Reg. No. 44,213	GARY B. SOLOMON, Reg. No. 44,347
STUART D. DWORK, Reg. No. 31,103	ROBERT W. MASON, Reg. No. 42,848	STEVE Z. SZCZEPANSKI, Reg. No. 27,957
WILLIAM F. ESSER, Reg. No. 38,053	ROGER L. MAXWELL, Reg. No. 31,855	ANDRE M. SZUWALSKI, Reg. No. 35,701
ROGER J. FRENCH, Reg. No. 27,786	ROBERT A. McFALL, Reg. No. 28,968	ALAN R. THIELE, Reg. No. 30,694
JANET M. GARETTO, Reg. No. 42,568	STEVEN T. McDONALD, Reg. No. 45,999	TAMSEN VALOIR, Reg. No. 41,417
JOHN C. GATZ, Reg. No. 41,774	LISA H. MEYERHOFF, Reg. No. 36,869	RAYMOND VAN DYKE, Reg. No. 34,746
RUSSELL J. GENET, Reg. No. 42,571	STANLEY R. MOORE, Reg. No. 26,958	BRIAN D. WALKER, Reg. No. 37,751
	RICHARD J. MOURA, Reg. No. 34,883	GERALD T. WELCH, Reg. No. 30,332
	MARK V. MULLER, Reg. No. 37,509	HAROLD N. WELLS, Reg. No. 26,044
	P. WESTON MUSSELMAN JR. Reg. No. 31,644	WILLIAM D. WIESE, Reg. No. 45,217

all of the firm of **JENKENS & GILCHRIST, a Professional Corporation**, 1445 Ross Avenue, Suite 3200, Dallas, Texas 75202-2799, as my attorneys and/or agents, with full power of substitution and revocation, to prosecute this application, provisionals thereof, continuations, continuations-in-part, divisionals, appeals, reissues, substitutions, and extensions thereof and to transact all business in the United States Patent and Trademark Office connected therewith, to appoint any individuals under an associate power of attorney and to file and prosecute any international patent application filed thereon before any international authorities, and I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization who/which first sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct them in writing to the contrary.

Please address all correspondence and direct all telephone calls to:

Richard J. Moura, Esq.
Jenkins & Gilchrist, P.C.
1445 Ross Avenue, Suite 3200
Dallas, Texas 75202-2799
214/855-4500
214/855-4300 (fax)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAMED INVENTOR(S)

1	Anders Borgström		
	Full Name	Inventor's Signature	Date
	V. Gyeholmsvägen 17A SE-239 32 SKANÖR, Sweden Residence (city, state, country) <div style="text-align: right;">Sweden Citizenship</div>		
	V. Gyeholmsvägen 17A SE-239 32 SKANÖR, Sweden Post Office Address (include zip code)		

(FOR ADDITIONAL INVENTORS, check here X and add additional sheet for inventor information regarding signature, name, date, citizenship, residence and address)

Variable	Mean	SD	Min	Max
Age	34.5	10.2	21	55
Gender	0.5	0.5	0	1
Marital Status	0.6	0.5	0	1
Education	12.5	1.5	9	16
Income	1500	500	500	3000
Health Status	0.8	0.2	0	1
Stress Level	4.5	1.5	1	7
Life Satisfaction	5.5	1.5	1	9
Work-Life Balance	6.5	1.5	1	9
Family Support	7.5	1.5	1	9
Community Involvement	3.5	1.5	1	7
Personal Growth	6.5	1.5	1	9
Financial Stability	7.5	1.5	1	9
Emotional Well-being	6.5	1.5	1	9
Physical Health	7.5	1.5	1	9
Social Connections	6.5	1.5	1	9
Work Satisfaction	6.5	1.5	1	9
Life Balance Score	6.5	1.5	1	9

2	Magnus Hollström		
	Full Name	Inventor's Signature	Date
	Filippavägen 6A SE-222 41 LUND, Sweden		
	Residence (city, state, country)		Sweden Citizenship
	Filippavägen 6A SE-222 41 LUND, Sweden		
	Post Office Address (include zip code)		

3	Torbjörn Gärdenfors		
	Full Name	Inventor's Signature	Date
	Kornettsgatan 24A SE-211 50 MALMÖ, Sweden <div style="text-align: right;">Sweden</div> Residence (city, state, country) Citizenship		
	Kornettsgatan 24A SE-211 50 MALMÖ, Sweden Post Office Address (include zip code)		